

## DESCRIPTION OF A NEW SPECIES OF THE GENUS *SIMULIUM* LATREILLE FROM SHENNONGJIA, HUBEI, CHINA

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**Abstract** A new species, *Simulium (Simulium) shennongjiaense* sp. nov. from Shennongjia, Hubei Province, China is described and illustrated. The type specimens are deposited in the Department of Biology, Guiyang Medical College.

**Key words** Diptera, Simuliidae, *Simulium*, new species, Hubei Province.

A total of 6 blackfly species have been listed in the Hubei Province by Chen and An (2002), but no blackfly species have been reported so far from Shennongjia Nature Reserve. In this paper, the authors report a new species, *Simulium (Simulium) shennongjiaense* sp. nov. collected on rocks in a flowing stream in Shennongjia. The description and comparison with closely related species are given below.

*Simulium (Simulium) shennongjiaense* **sp. nov.**  
(Figs. 1–14)

Female. Body length 3.0 mm. Wing length 2.7 mm.

Head. Frons and clypeus brownish black, thinly grey pruinose and covered with

several yellowish hairs. Frontal ratio 6.5: 6.0: 6.0. Frons head ratio 6.5: 27. Antenna composed of 2 + 9 segments, which are brownish black except for the brownish yellow scape, pedicel and 1st flagellar segment. Maxillary palp with 5 segments in the proportion of 2.4: 2.5: 5.8: 5.0: 12.6. 3<sup>rd</sup> segment of moderate size, sensory vesicle oblong, about 0.34 length of 3<sup>rd</sup> segment. Maxilla with about 13 inner teeth and 14 outer ones. Mandible with about 28 inner teeth and 14 out ones. Cibarium lacking denticles but with a prominent median projection on posterior border.

Thorax. Scutum dark brownish, grey-dusted, covered with yellow pubescence. Scutellum dark brownish, with yellow pubescence and several brown long hairs. Postscutellum brownish black and bare. Katepisternum and pleural membrane bare. Legs. Foreleg brownish black except coxa, trochanter, basal 3/5 of femur and basal 3/4 of tibia yellow. Midleg brownish black except basal 1/2 of trochanter, basal 2/3 of femur, basal 4/5 of tibia and basal 2/5 of basitarsus yellow. Hindleg dark brown except trochanter, basal 3/5 of femur, basal 3/4 of tibia, basal 2/3 of basitarsus and basal 1/2 of second tarsomere yellow. Fore basitarsus somewhat dilated distally, W: L = 1.0: 5.5. Hind basitarsus parallel-sided, W: L = 1.0: 5.0. Calcipala and pedisulcus distinct. All claws simple. Wings. Costa with spinules as well as hairs; subcosta hairy, basal section of radius bare; hair tuft of sten vein blackish.

Abdomen. Basal scale blackish with a fringe of long dark hairs. Terga dark brown and not shiny. Genitalia. Sternite 8 well sclerotized, with about 15 long dark hairs on each side. Anterior gonapophyses triangular, somewhat rounded on posterior internal tip, membranous, covered with about 10 microsetae, inner border nearly straight, narrowly sclerotized. Genital fork of inverted Y-shaped, with well sclerotized stem; each arm with strongly sclerotized projection directed forward and a strongly sclerotized posterolateral ridge. Paraproct and cercus of moderate size. Spermatheca somewhat oval in shape and unpatterned.

Male. Body length 3.4 mm. Wing length 2.8 mm.

Head. As wide as thorax. Upper eye consisting of 19 vertical columns and 14 horizontal rows of large facets. Clypeus brownish black, whitish grey pruinose, covered with long dark hairs. Antenna composed of 2 + 9 segments, brownish black with scape, pedicel and base of 1<sup>st</sup> flagellar segment brownish yellow; 1<sup>st</sup> flagellar segment elongate, about 2.4 times as long as length of following one. Maxillary palp composed of 5 segments, sensory oblong, about 0.3 length of 3<sup>rd</sup> segment.

Thorax. Nearly same as in female except medium large portion yellow of all tibiae, hind basitarsus somewhat yellow.

Abdomen. Basal scale blackish with a fringe of long dark hairs. Terga dark brown and not shiny. Genitalia. Sternite 8 well sclerotized, with about 15 long dark hairs on each side. Anterior gonapophyses triangular, somewhat rounded on posterior internal tip, membranous, covered with about 10 microsetae, inner border nearly straight, narrowly sclerotized. Genital fork of inverted Y-shaped, with well sclerotized stem; each arm with strongly sclerotized projection directed forward and a strongly sclerotized posterolateral ridge. Paraproct and cercus of moderate size. Spermatheca somewhat oval in shape and unpatterned.

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what inflate and wing's subcosta bare.

**Abdomen.** Nearly as in female. **Genitalia.** Coxite somewhat quadrate in shape, much shorter than wide. Style about 2.5 times as long as its greatest width near basal part, narrowed down behind the basal 1/3 towards the middle and widening again near posterior end, which are rounded and bearing a subapical spine; each style on dorso-internal surface bearing a basal protuberance strongly sclerotized and bearing several stout teeth on its anterior margin and apical surface. Ventral plate very characteristic, subspear-shaped and pointed posteriorly; plate body nearly smooth and with strongly sclerotized arm. Parameres each with numerous paramenal hooks. Median sclerite plate-like, gradually widened distally and with rounded end and a cleft apically.

**Pupa.** Body length about 3.5 mm.

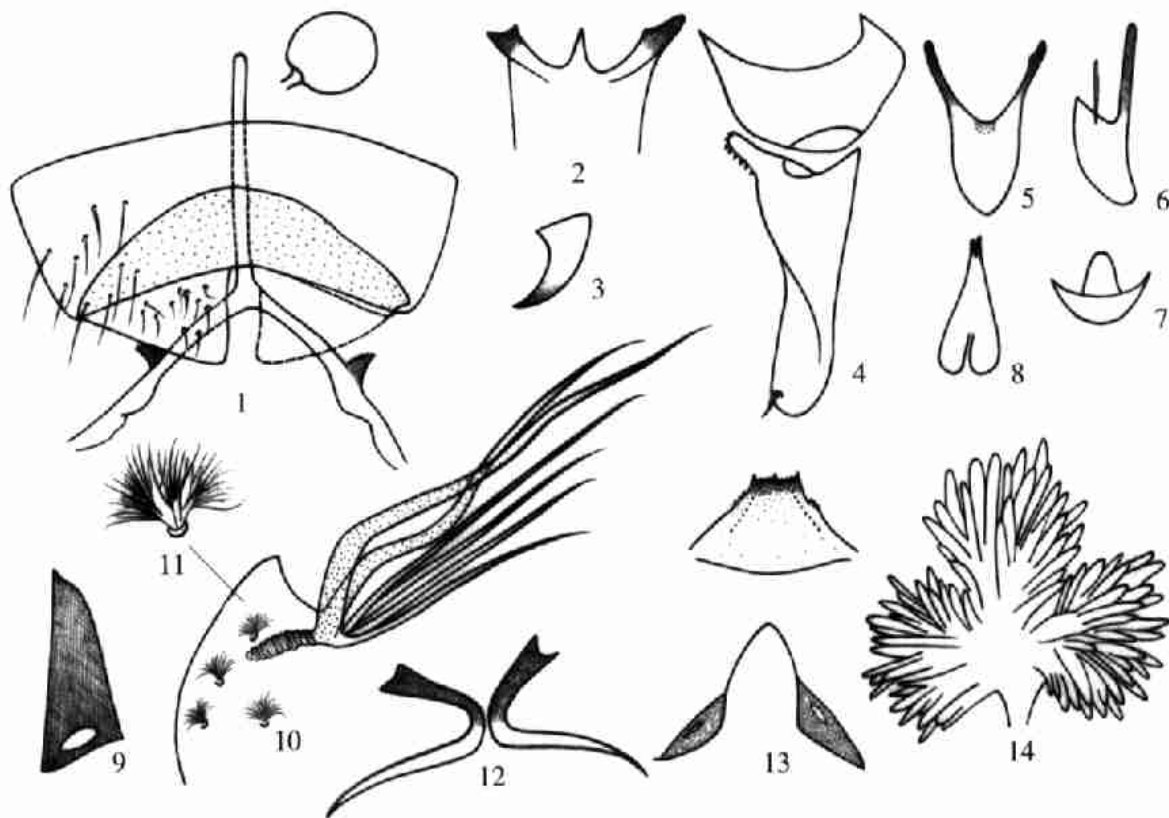
**Head and thorax.** Integument brownish yellow, uniformly covered with dense cone-like tubercles. Head trichomes 3 pairs, all long, brush-like, each split into 8-12 branches. Thoracic trichomes 5 pairs, all long, brush-like, each split into 18-24 branches. Gill length

about 1.2 mm with 6 filaments nearly arising from base, arranged in three pairs, first filament of upper pair stoutest of all and upper 3 filaments brown, larger in diameter and longer than lower 3 ones, which are pale yellow.

**Abdomen.** Tergum 1 brown and lacking tubercles. Tergum 2 with 4 stout setae and 2 simple setae on each side. Terga 3 and 4 each with 4 hooked spines along posterior margin on each side. Terga 7 and 8 each with transverse row of spine combs and a comb-like groups of minute spines on each side. Tergum 9 lacking terminal hooks. Sternum 5 with a pair of bifid hooks submedially on each side; sternum 6 and 7 each with pair of bifid inner and simple outer hooks widely spaced on each side.

**Cocoon.** Slipper shaped, tightly woven, two large windows anterolaterally and having a strong anterior margin.

**Mature larva.** Body length about 6.0 mm. Body color pale yellow. Cephalic apotome brown, with indistinct or positive head spots. Antenna with 4 segments in proportion of 4.9: 8.7: 4.0: 0.5, longer



Figs 1-14. *Simulium* (*Simulium*) *shennongjiaense* sp. nov. 1. Female genitalia. 2. Female cibarial pump. 3. Female claw. 4. Coxite and style of male. 5. Ventral plate in ventral view. 6. Ventral plate in lateral view. 7. Ventral plate in end view. 8. Median sclerite. 9. Cocoon. 10. Pupal thorax and filaments. 11. Pupal thoracic trichomes. 12. Larval anal sclerite. 13. Larval head capsule in ventral view. 14. Larval anal gills.

than labral fan; each labral fan with about 46 main rays. Mandibular serrations composed of 1 large and 1

small teeth, without supernumerary serrations. Hypostomal teeth 9 in number, median tooth and each corner tooth longer than others. Lateral serration moderately developed on apical 1/2; 7 or 8 hypostomal bristles diverging posteriorly from lateral margin on each side. Postgenal cleft subpear-shaped, lateral margins on basal 1/3 parallel-sided, about 3.0 times as long as postgenal bridge. Thoracic and abdominal integument bare. Rectal gill lobes compound, each with 22-26 finger-like secondary lobules. Anal sclerite X-shaped, with broadened anterior arms about 0.55 times as long as posterior ones. Posterior circlet with about 114 rows of up to 24 hooklets per row.

Holotype ♀, slide mounted together with its associated pupal exuvia collected from Xigou, Shennongjia, Hubei Province (31°32' N, 110°17' E), 1680 m, 14 Aug. 2004, by LUO Hong Bin. Paratypes: 1 ♀, 1 ♂, 9 pupae and 4 mature larvae, same data as holotype.

Ecological notes. The pupae and larvae were taken from some rocks in fast flowing stream at altitude of 1680 m. Water temperature was 15 °C.

Distribution. Hubei Province, China.

Remarks. According to the female unpatented scutum, simple tarsal claws, the male style with short basal protuberance, and the 6-filamented pupal gill, this new species is assigned in the *tuberosum*-group as

defined by Takaoka and Davies (1995). The present new species is characterized by female cibarium armed with median projection; the male ventral plate subpear-shaped and the pupal head and thoracic trichomes multiple-branched and brush-like, by which those may distinguished from all other known species of this group.

*S. (S.) biforamiferum* Datta, 1974 from India and *S. (S.) ramulosum* Chen, 2000 from China show similar pupal head and thoracic trichomes being multiple-branched and brush-like. However, *S. (S.) biforamiferum* differs in having terminal hooks in the pupa, *S. (S.) ramulosum* differs by the shape of postgenal cleft, anal sclerite with ring of minute setae and the rectal gill lobes each only with about 8 finger-like secondary lobules in the larva.

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## 湖北省神农架蚋属一新种 (双翅目, 蚋科)

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摘 要 记述采自神农架自然保护区蚋科昆虫 1 新种。根据雌虫盾片无斑纹, 爪简单, 雄虫生殖肢端节具基突, 生殖腹板无齿, 蛹具 3 对呼吸丝等特征, 新种隶属于蚋属蚋亚属 *Simulium (Simulium)* 的块根蚋组 *tuberosum*-group。新种依其雄虫生殖腹板呈亚箭形的特殊性状, 雌虫食窦弓具中突及

关键词 双翅目, 蚋科, 蚋属, 新种, 湖北省。

中图分类号 Q969.442.9

蛹头胸毛多分支呈刷状等综合特征, 可与蚋属已知种包括该组的近缘种相区别。正模♀, 副模, 1♀, 1♂, 9蛹, 4幼虫, 均采自神农架山溪急流的石块上。模式标本存放于贵阳医学院生物学教研室。